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EXAMINER

LEUNG, CHRISTINA Y

ART UNIT

PAPER NUMBER

2613

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/829,608

Applicant(s)

LIGHT, GRETA

Examiner

Christina Y. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06 March 2006 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 6-12, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benzoni et al. in view of qLogic ("SANblade: 2-Gbps Fibre Channel to PCI Express Host Bus Adapter," dated 09/03 by qLogic Corporation)..

Regarding claim 6, Benzoni et al. disclose an optoelectronic interface device, comprising:
an optical transceiver (Figures 1, 6, and 11-13) configured to mechanically and electrically interface with another device (via connector leads 16) and comprising:
a housing (including outer package 60 shown in Figure 12; column 7, lines 16-26);
a transmit optical subassembly (including lens holder 34₁, lens 42₁, and ferrule receptacle 50, which are associated with light emitting diode LED 26 as shown in Figure 12) and a receive optical subassembly (including lens holder 34₂, lens 42₂, and ferrule receptacle 52, which are

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associated with photodiode 28 as shown in Figure 12) substantially disposed within the housing, each optical subassembly defining a corresponding longitudinal axis (i.e., the axis shown in Figure 12 as a dashed line along the ferrule receptacles, vertical with respect to the page; this axis corresponds to the axis pointing out of the page in the view of Figure 6; column 4, lines 44-47; column 6, lines 37-39),

an optical transmitter being mounted within the transmit optical subassembly and an optical receiver being mounted within the receive optical subassembly (transmitter LED 26 and receiver photodiode 28 are each mounted “within” the respective subassemblies, specifically within respective apertures 44 in respective lens holders 34, which support the ferrule receptacles 50 and 52; column 6, lines 14-39; see also Figure 7);

a transceiver substrate 12 substantially disposed within the housing and residing in a plane that is substantially perpendicular to the longitudinal axes respectively defined by the transmit optical subassembly and the receive optical subassembly, the transceiver substrate including electronic circuitry (including transmitter circuit 18 and receiver circuit 20; column 4, lines 2-47); and

a connector (leads 16) located on an end of the transceiver substrates the connector mounted on a surface of the transceiver substrate in the plane that is substantially perpendicular to the longitudinal axes (Figures 11-13 show how the substrate 12 and connector leads 16 define a plane that is perpendicular to the axis of light transmitted and received through the ferrule receptacles 50 and 52).

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Benzoni et al. disclose leads 16 which inherently enable the disclosed transceiver elements to be connected to another device, but they do not specifically disclose connecting the transceiver to a host bus adapter.

However, qLogic teaches a host bus adapter, including an optical transceiver such as already disclosed by Benzoni et al. qLogic further teaches that the host bus adapter has a printed circuit board and at least one connector (i.e., an array of pins on the board) for electrically interfacing with a host device.

Further regarding claims 7 and 8 in particular, qLogic further teaches a host bus adapter that is configured to be substantially received within a standard PCI card slot of the host device (see third item under “Features” on page 1)

Regarding claims 9, 10, and 11, qLogic further teaches a host bus adapter comprising a printed circuit board for a peripheral component interconnect (PCI) card, further comprising a face plate defining cutouts and being attached, at least indirectly, to at least one of a optical transceiver and, the host bus adapter (see Figure on page 1), and wherein the faceplate includes at least one status indicator (see eighth item under “Features” on page 1).

Regarding claims 6-11, it would have been obvious to a person of ordinary skill in the art to use the host bus adapter taught by qLogic with the transceiver disclosed by Benzoni et al. in order to enable the optical transceiver to be readily installed in a host device using standardized physical slots and also in order to provide status indicators to monitor the operation of the transceiver.

Regarding claim 12, Benzoni et al. disclose an optical transceiver (Figures 1, 6, and 11-13) comprising:

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a housing (including outer package 60 shown in Figure 12; column 7, lines 16-26);

a transmit optical subassembly (including lens holder 34₁, lens 42₁, and ferrule receptacle 50) substantially disposed within the housing and defining a longitudinal axis (i.e., an axis shown as a dashed line in Figure 12), an optical transmitter (LED 26) being mounted within the transmit optical subassembly (specifically, within aperture 44 of the lens holder 34₁; column 6, lines 14-39; see also Figure 7);

a receive optical subassembly (including lens holder 34₂, lens 42₂, and ferrule receptacle 52) substantially disposed within the housing and defining a longitudinal axis (i.e., an axis shown as a dashed line in Figure 12), an optical receiver (photodiode 28) being mounted within the receive optical subassembly (specifically within aperture 44 of the lens holder 34₂; column 6, lines 14-39; see also Figure 7);

a transceiver substrate 12 substantially disposed within the housing and residing in a plane that is substantially perpendicular to the longitudinal axes respectively defined by the transmit optical subassembly and the receive optical subassembly (Figures 11-13 show how the substrate 12 defines a plane that is perpendicular to the axis of light transmitted and received through the ferrule receptacles 50 and 52);

the transceiver substrate including electronic circuitry (including transmitter circuit 18 and receiver circuit 20; column 4, lines 2-47), and the transceiver substrate being physically and electrically connected to the transmit optical subassembly and the receive optical subassembly (Figure 3 shows electrical connections between substrate 12 and LED 26/photodiode 28 of the subassemblies; Figure 12 shows the physical connections between substrate 12 and the ferrule receptacles of the subassemblies); and

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a connector (leads 16) connected to the transceiver substrate, the connector mounted at a surface of the transceiver substrate in the plane, wherein the connector electrically and mechanically connects the transceiver substrate to another device.

Benzoni et al. disclose leads 16 which inherently enable the disclosed transceiver elements to be connected to another device, but they do not specifically disclose connecting the transceiver to a host bus adapter.

However, again, qLogic teaches a host bus adapter that is a PCI card including an optical transceiver such as already disclosed by Benzoni et al. Regarding claim 14 in particular, qLogic teaches connecting the host bus adapter to an optical transceiver such that the transceiver is at an edge of the adapter (see Figure on page 1). Regarding claim 15 in particular, qLogic teaches that the host bus adapter is a PCI card.

Regarding claims 12, 14, and 15, it would have been obvious to a person of ordinary skill in the art to use the host bus adapter/PCI card taught by qLogic with the transceiver disclosed by Benzoni et al. in order to enable the optical transceiver to be readily installed in a host using standardized physical slots. Further regarding claim 14 in particular, it also would have been obvious to a person of ordinary skill in the art to connect the transceiver to an edge of the host bus adapter as suggested by qLogic so that the ferrule receptacles of the transceiver as disclosed by Benzoni et al. are located on the outside of the overall system and thereby more conveniently allow optical fibers to be attached to the system.

4. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Benzoni et al. in view of qLogic as applied to claim 12 above, and further in view of Dwarkin et al. (US 6,454,470 B1).

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Regarding claim 13, Benzoni et al. in view of qLogic describe an optical transceiver as discussed above with regard to claim 12, but they do not specifically disclose data rates at least 10 Gbps. However, Dwarkin et al. teach optical transceivers that are used in connection with 10 Gbps data rates (column 1, lines 43-44). It would have been obvious to a person of ordinary skill in the art to use optical transceiver elements suitable for 10 Gbps data rates as taught by Dwarkin et al. in the system described by Benzoni et al. in view of qLogic in order to transmit data more efficiently.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Benzoni et al. in view of qLogic as applied to claim 12 above, and further in view of Giboney et al. (US 6,318,909 B1).

Regarding claim 16, Benzoni et al. in view of qLogic describe an optical transceiver as discussed above with regard to claim 12 including a transceiver substrate defining front and rear sides and having electronic circuitry. They do not specifically disclose disposing the circuitry on both the front and rear sides of the substrate, but Giboney et al. teach a system related to the one disclosed by Benzoni et al., including an optical transceiver and a transceiver substrate 25 (Figures 1A and 1E). Giboney et al. further teach placing circuitry on both sides of the transceiver substrate (column 9, lines 46-54). It would have been obvious to a person of ordinary skill in the art to place circuitry on both sides of the transceiver substrate as taught by Giboney et al. in the system described by Benzoni et al. in view of qLogic in order to more efficiently use the area of the substrate and thereby advantageously allow the circuitry to fit in a smaller overall area.

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6. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benzoni et al. in view of qLogic as applied to claim 12 above, and further in view of Jiang et al. (US 6,632,030 B2).

Regarding claims 17 and 18, Benzoni et al. in view of qLogic describe an optical transceiver as discussed above with regard to claim 12. They do not specifically disclose that at least one of the transmit optical subassembly and the receive optical subassembly includes at least one electrical pin configured and arranged to be received in a corresponding electrical receptacle of the transceiver substrate or at least one electrical receptacle configured and arranged to receive a corresponding electrical pin of the transceiver substrate.

However, Benzoni et al. do disclose that an optical transmitter (LED 26) mounted within the transmit optical subassembly, and an optical receiver (photodiode 28) mounted within the receive optical subassembly, are electrically connected to other elements of the system by surface mount connections to a board (column 5, lines 2-35). Various ways of providing an electrical connection/contact between components are well known in the art. Specifically, Jiang et al. teach an optical transceiver system (Figures 1A-D and 2A-B) that is related to the one disclosed by Benzoni et al. including a transmit optical subassembly 118 and a receive optical subassembly 116. Jiang et al. further teach that the optical subassemblies 116 and 118 may be connected to transceiver substrates 132 and 134 in various ways including a surface mount such as disclosed in the system of Benzoni et al. or using electrical pins (i.e., leads 206 and 214; column 3, lines 40-64).

Regarding claim 18 in particular, although Jiang et al. more explicitly show pins/leads 206 and 214 that are first attached to an optical subassembly and then received in a

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corresponding electrical receptacle of a transceiver substrate, but it is well known in the art that an electrical pin may be first attached to either element and received by the other. Examiner notes that it is well understood in the electrical art that when an electrical component is electrically connected to a substrate by an electrical pin, the electrical connection provided by the pin is the same regardless of which element "receives" the pin; in the complete apparatus, both the component and substrate are similarly electrically connected to the pin.

Regarding both claims 17 and 18, It would have been obvious to a person of ordinary skill in the art to provide an electrical pin as suggested by Jiang et al. as the electrical connection in the system described by Benzoni et al. in view of qLogic as an engineering design choice of a way to effectively connect the already disclosed subassembly to the already disclosed substrate and thereby allow the electrical components to properly communicate with each other.

7. Claims 1-3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benzoni et al. in view of Jiang et al.

Regarding claim 1, Benzoni et al. disclose an optical device (Figures 1-14, particularly Figures 1, 6, and 11-13) comprising:

a housing (including outer package 60 shown in Figure 12; column 7, lines 16-26);

at least one optical subassembly and an optoelectronic component mounted within the optical subassembly (including light emitting diode LED 26 and photodiode 28 shown in Figures 6 and 12 and ferrule receptacles 50 and 52 shown in Figure 12; column 4, lines 44-47; column 6, lines 37-39) substantially disposed within the housing and defining a longitudinal axis (i.e., the axis shown in Figure 12 as a dashed line along the ferrule receptacles, vertical with respect to the page; this axis corresponds to the axis pointing out of the page in the view of Figure 6);

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a substrate 12 substantially disposed within the housing and residing in a plane that is substantially perpendicular to the longitudinal axis defined by the at least one optical subassembly, the substrate including electronic circuitry (such as transmitter circuit 18 and receiver circuit 20; column 4, lines 2-47); and

a connector (including leads 16) disposed on one end of the substrate and mounted on a surface of the substrate within the plane that is substantially perpendicular to the longitudinal axis (Figures 11-13 show how the substrate 12 and connector leads 16 define a plane that is perpendicular to the axis of light transmitted and received through the ferrule receptacles 50 and 52).

Benzoni et al. further disclose that the substrate is electrically connected to the optoelectronic components of the optical subassemblies by surface mount connections (column 5, lines 2-35), but they do not specifically disclose that the subassembly includes electrical connections in communication with the optoelectronic components and further interfacing with electrical connection in the substrate.

However, again, various ways of providing an electrical connection/contact between components are well known in the art. Specifically, Jiang et al. teach an optical transceiver system (Figures 1A-D and 2A-B) that is related to the one disclosed by Benzoni et al. including a transmit optical subassembly 118 and a receive optical subassembly 116. Jiang et al. further teach that the optical subassemblies 116 and 118 may be connected to transceiver substrates 132 and 134 in various ways including a surface mount such as disclosed in the system of Benzoni et al. or using electrical connection pins between the subassemblies, the components, and the substrate (i.e., leads 206 and 214; column 3, lines 40-64).

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It would have been obvious to a person of ordinary skill in the art to provide the electrical connections taught by Jiang et al. in the system disclosed by Benzoni et al. as an engineering design choice of a way to effectively connect the already disclosed subassembly to the already disclosed substrate and thereby allow the electrical components to properly communicate with each other. One in the art would have been particularly motivated to use the electrical connections taught by Jiang et al. in order to provide a way to protectively enclose the light emitting and receiving devices in a fixed package, while allowing the devices to extend their electrical connections outside the subassembly so that they may properly connect to the other components on the transceiver substrate.

Regarding claim 2, Benzoni et al. disclose that the at least one optical subassembly comprises at least one of: a transmit optical subassembly (including LED 26) and a receive optical subassembly (including photodiode 28; column 4, lines 44-47).

Regarding claim 3, Benzoni et al. disclose that the connector 16 is in electrical communication with at least some of the electronic circuitry of the substrate (Figure 3, for example, clearly shows the electrical connections between connector leads 16, the transmitter and receiver circuits 18 and 20, LED 26, and photodiode 28).

Regarding claim 5, Benzoni et al. disclose that the at least one optical subassembly is mechanically and electrically connected to the substrate (Figure 3 shows the electrical connection of the LED 26 and photodiode 28 of the subassemblies to the substrate 12; Figure 12 shows the physical connection of the extended ferrule receptacles 50 and 52 of the subassemblies to the substrate 12).

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8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Benzoni et al. in view of Jiang et al. as applied to claims 1 and 3 above, and further in view of qLogic.

Regarding claim 4, Benzoni et al. in view of Jiang et al. suggest a system as discussed above with regard to claims 1 and 3 above, including leads 16 which inherently enable the disclosed transceiver elements to be connected to another device (Benzoni et al., Figure 1), but they do not specifically suggest connecting the transceiver to a host bus adapter. However, qLogic teaches a host bus adapter including an optical transceiver such as already disclosed by Benzoni et al. Regarding claim 4, it would have been obvious to a person of ordinary skill in the art to use the host bus adapter taught by qLogic with the transceiver described by Benzoni et al. in view of Jiang et al. in order to enable the optical transceiver to be readily installed in a host using standardized physical slots.

Response to Arguments

9. Applicant's arguments with respect to claims 1, 17, and 18 in particular have been considered but are moot in view of the new ground(s) of rejection.

10. Applicant's arguments filed with respect to claims 6 and 12 in particular have been fully considered but they are not persuasive.

11. Regarding claims 6 and 12 in particular, Examiner respectfully submits that Benzoni et al. disclose an optical transmitter (LED 26) "mounted within" a transmit optical subassembly. Specifically, LED 26 is mounted within aperture 44 in a lens holder 34 (column 6, lines 14-39; Figure 7), wherein lens holder 34 is part of a subassembly further including a lens 42 and a ferrule receptacle 50. Likewise, Benzoni et al. disclose an optical receiver (photodiode 28) also

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mounted within a respective aperture 44 in a respective lens holder 34 of a receive optical subassembly.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 571-272-3023. The examiner can normally be reached on Monday to Friday, 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


CHRISTINA LEUNG
PRIMARY EXAMINER